IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-3 (Canceled):

Claim 4 (Previously Presented): A power supply comprising:

an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage;

a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load to provide a controlled output voltage of the DC/DC converter, while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load;

a DC converter connected to an input of the DC/DC converter; and

DC power storage means which supplies electric power to the DC/DC converter through the DC converter;

wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means;

wherein the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage, while the DC converter supplies the electric power received from the DC power storage means to the input of the DC/DC converter;

wherein the DC converter includes:

a first converter having an AC terminal, and a DC terminal connected to the input of the DC/DC converter;

a transformer having a high-voltage side winding connected to the AC terminal of the first converter, and a low-voltage side winding; and

a second converter having an AC terminal connected to the low-voltage side winding, and a DC terminal connected to the DC power storage means;

wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.

Claim 5 (Previously Presented): A power supply according to 8, wherein the DC converter is connected to an output of the AC/DC converter so that the DC converter controls an output voltage of the DC converter to be lower than an output voltage of the AC/DC converter, while the DC converter outputs the electric power from the AC/DC converter to thereby charge the DC power storage means.

Claim 6 (Previously Presented): A power supply according to claim 4, wherein the DC converter is connected to an output of the AC/DC converter so that the DC converter controls an output voltage of the DC converter to be lower than an output voltage of the AC/DC converter, while the DC converter outputs the electric power from the AC/DC converter to thereby charge the DC power storage means.

Claim 7 (Previously Presented): A power supply according to claim 6, wherein each of the first and second converters performs power conversion based on ON/OFF actuation of a semiconductor switching device contained in each of the first and second converters.

Claim 8 (Previously Pres nted): A power supply comprising:

an AC/DC converter which receives AC power having an AC input voltage, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter to be equal to a predetermined DC voltage higher than an effective value of the AC input voltage;

a DC/DC converter which receives the DC power from the AC/DC converter and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load to provide a controlled output voltage of the DC/DC converter, while the DC/DC converter supplies the controlled output voltage of the DC/DC converter to the load;

a DC converter connected to an input of the DC/DC converter; and

DC power storage means which supplies electric power to the DC/DC converter through the DC converter;

wherein the DC converter is bidirectional to enable the DC converter to charge and discharge the DC power storage means;

wherein, when electric power is interrupted or the AC/DC converter cannot maintain sufficient electric power output to be consumed by the load, the DC converter controls an output voltage of the DC converter to be boosted over a voltage of the DC power storage means and to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage higher than the effective value of the AC input voltage, while the DC converter supplies the electric power from the DC power storage means to the input of the DC/DC converter;

wherein the DC converter includes:

a first converter having an AC terminal, and a DC terminal connected to the input of the DC/DC converter;

a transformer having a high-voltage side winding connected to the AC terminal of the first converter, and a low-voltage side winding; and

a second converter having an AC terminal connected to the low-voltage side winding, and a DC terminal connected to the DC power storage means;

wherein the transformer separates the DC power storage means from the AC/DC converter and from the DC/DC converter.

Claim 9 (Previously Presented): A power supply according to claim 8, wherein the DC converter is connected to an output of the AC/DC converter so that the DC converter controls an output voltage of the DC converter to be lower than an output voltage of the AC/DC converter, while the DC converter outputs the electric power from the AC/DC converter to thereby charge the DC power storage means.

Claim 10 (Previously Presented): A power supply according to claim 9, wherein each of the first and second converters performs power conversion based on ON/OFF actuation of a semiconductor switching device contained in each of the first and second converters.

Claim 11 (Previously Presented): A power supply according to claim 4, further comprising a charger connected to an AC input for converting AC power into DC power and charging the DC power storage means with the DC power.

Claim 12 (Previously Presented): A power supply according to claim 8, further comprising a charger connected to an AC input for converting AC power into DC power and charging the DC power storage means with the DC power.

Claim 13 (Previously Present d): A power supply according to claim 8, wherein the AC/DC converter includes a power interruption detecting circuit which generates a power interruption detection signal, when the power interruption detecting circuit detects interruption of the AC power, and which supplies the power interruption detection signal to the DC converter; and

wherein the DC converter supplies DC power to the DC/DC converter, when the power interruption detection signal is supplied to the DC converter.

Claim 14 (Previously Presented): A power supply according to claim 4, wherein the AC/DC converter includes a plurality of unit AC/DC converters connected in parallel with one another;

wherein the DC/DC converter includes a plurality of unit DC/DC converters connected in parallel with one another; and

wherein the DC converter includes a plurality of unit DC converters connected in parallel with one another.

Claim 15 (Canceled):

Claim 16 (Previously Presented): A power supply according to claim 4, further comprising a second DC/DC converter connected between an output of the AC/DC converter and the first-mentioned DC/DC converter;

wherein the AC/DC converter outputs the DC power to the input of the first-mentioned DC/DC converter through the second DC/DC converter; and

wherein the first-mentioned DC/DC converter includes a plurality of unit DC/DC converters connected in parallel with one another.

Claim 17 (Pr vi usly Presented): A power supply according to claim 4, further comprising a second DC/DC converter connected between an output of the AC/DC converter and the first-mentioned DC/DC converter;

wherein the AC/DC converter outputs the DC power to the input of the first-mentioned DC/DC converter through the second DC/DC converter;

wherein the first-mentioned DC/DC converter includes a plurality of unit DC/DC converter groups each of which is constituted by a plurality of unit DC/DC converters connected in parallel with one another; and

wherein the plurality of unit DC/DC converter groups have a common input and supply electric power to independent load portions, respectively, constituting the load.

Claim 18 (Previously Presented): A power supply according to claim 4, further comprising a second DC/DC converter connected between an output of the AC/DC converter and the first-mentioned DC/DC converter;

wherein the AC/DC converter outputs the DC power to the input of the first-mentioned DC/DC converter through the second DC/DC converter; and

wherein the first-mentioned DC/DC converter includes a plurality of unit DC/DC converters which have a common input connected to the second DC/DC converter, and outputs for supplying electric power to independent load portions, respectively, constituting the load.

Claim 19 (Previously Presented): A power supply according to claim 4, wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage based on ON/OFF actuation of a semiconductor switching device of a main circuit of the AC/DC converter and effects control to suppress harmonic current in the received AC power.

Claim 20 (Previously Presented): A power supply comprising a plurality of power supply units connected in parallel with one another, wherein each of the plurality of power supply units includes:

an AC/DC converter which receives AC power, converts the AC power into DC power, and outputs the DC power, the AC/DC converter including a control circuit which controls an output voltage of the DC power output from the AC/DC converter to be equal to a predetermined DC voltage;

a DC/DC converter which receives the DC power from the AC/DC converter, and controls a level of an output voltage of the DC/DC converter to be equal to a level of a voltage to be used by a load, while the DC/DC converter supplies the output voltage to the load;

a DC converter connected to an input of the DC/DC converter; and

DC power storage means which supplies electric power to the DC/DC converter through the DC converter, the DC converter being bidirectional to charge and discharge the DC power storage means;

wherein the control circuit controls the output voltage of the DC power of the AC/DC converter to be equal to a predetermined DC voltage on the basis of ON/OFF actuation of a semiconductor switching device of a main circuit of the AC/DC converter and effects control to suppress harmonic current in the received AC power; and

wherein the DC converter controls an output voltage of the DC converter to be substantially equal to the output voltage of the DC power of the AC/DC converter which is controlled to be equal to the predetermined DC voltage, while the DC power storage means supplies electric power to the DC/DC converter through the DC converter.

Claim 21 (Previously Presented): A power supply according to claim 4, wherein the DC converter includes a plurality of multiplexed DC converters connected in parallel.

Claim 22 (Canceled):

Claim 23 (Previously Presented): A power supply comprising:

an AC/DC converter to convert an input AC voltage into a DC voltage at a predetermined level higher than an effective value of the AC input voltage;

a DC converter to convert a DC power of a battery into a DC voltage having a level substantially equal to the predetermined level of the DC voltage output from the AC/DC converter; and

a DC/DC converter to convert the DC voltage from one of the AC/DC converter and the DC converter into an output DC voltage required by a load, and to provide a controlled output DC voltage to the load;

wherein, when there is power interruption, or when the AC/DC converter cannot maintain sufficient DC voltage to be consumed by the load, the DC converter controls the DC voltage to be boosted over the DC voltage of the battery and to be substantially equal to the predetermined level of the DC voltage output from the AC/DC converter, while the DC converter supplies the DC voltage from the battery to the DC/DC converter.

Claim 24 (Previously Presented): A power supply according to claim 23, wherein the DC converter comprises:

a first converter having an AC terminal, and a DC terminal connected to the input of the DC/DC converter;

a transformer having a high-voltage side winding connected to the AC terminal of the first converter, and a low-voltage side winding; and

a second converter having an AC terminal connected to the low-voltage side winding, and a DC terminal connected to the battery;

wherein the transformer separates the battery from the AC/DC converter and from the DC/DC converter.

Claim 25 (Previously Presented): A power supply according to claim 24, wherein each of the first and second converters includes a semiconductor switching element and performs power conversion based on ON/OFF actuation of the semiconductor switching device included therein.

Claim 26 (Previously Presented): A power supply according to claim 24, further comprising a charger connected to an AC input for converting AC power into DC power and charging the battery with the DC power.

Claim 27 (Previously Presented): A power supply according to claim 24,

wherein the AC/DC converter includes a power interruption detecting circuit arranged to generate a power interruption detection signal to the DC converter, upon detection of power interruption the AC power; and

wherein the DC converter supplies DC power to the DC/DC converter, upon reception of the power interruption detection signal.

Claim 28 (Previously Presented): A power supply according to claim 24,

wherein the AC/DC converter includes a plurality of unit AC/DC converters connected in parallel with one another;

wherein the DC/DC converter includes a plurality of unit DC/DC converters connected in parallel with one another; and

wherein the DC converter includes a plurality of unit DC converters connected in parallel with one another.